



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,008	12/28/2001	Sudhakar Bobba	03226.157001;P6865	7852
32615	7590	01/26/2006	EXAMINER	
OSHA LIANG L.L.P./SUN 1221 MCKINNEY, SUITE 2800 HOUSTON, TX 77010			GRAYBILL, DAVID E	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

MAILED

JAN 2

Grice



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

MAILED  
JAN 2 2006  
GROUP 2800

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

MAILED  
JAN 25 2006  
GROUP 2800

Application Number: 10/033,008  
Filing Date: December 28, 2001  
Appellant(s): BOBBA ET AL.

\_\_\_\_\_  
Wasif H. Qureshi  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 11-8-5 appealing from the Office action mailed 3-4-5.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

Appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

Appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

In the rejections *infra*, generally, reference labels are recited only for the first recitation of identical claim elements.

Claims 1-14 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bui (5689139).

At column 9, line 27 to column 11, line 61, Bui discloses the following:

A bump and vias structure, comprising; a metal layer ("first metal interconnection line" 30/50); a plurality of vias 32a connecting the metal layer to another metal layer ("second metal interconnection layer" 31 [not illustrated in Fig. 5]); a bump 53 (illustrated in FIG. 5 but apparently misidentified as "43" at column 7, line 62, the bump 53 "filling the via" 32B [second lowest 32B in Fig. 3]) mounted on the metal layer 30/50; and a first slot 33 (upper leftmost in Fig. 3, not illustrated in Fig. 5) formed in the metal layer 30/50 between the vias 32a and the bump; wherein the bump is

mounted on the metal layer via a landing pad 54; second and third slots 33 disposed between the first slot and the bump (illustrated in Fig. 3); wherein the second and third slots are displaced laterally along the metal layer and form an aperture (at least the first slot) therebetween that is centered with respect to the first slot; wherein the first slot comprises a section of the metal layer that is evacuated of conductive material; wherein the first slot comprises a current-resistant material "the unetched portions of the dielectric layer form slots in the interconnection layer"; wherein the first slot comprises a dielectric material.

An integrated circuit, comprising; a metal layer; a plurality of vias connecting the metal layer to another metal layer; a bump mounted on the metal layer; and a first slot formed in the metal layer between the vias and the bump; wherein the bump is mounted on the metal layer via a landing pad; second and third slots disposed between the first slot and the bump; wherein the second and third slots are displaced laterally along the metal layer and form an aperture therebetween that is centered with respect to the first slot; wherein the first slot comprises a section of the metal layer that is evacuated of conductive material; wherein the first slot comprises a current resistant material; wherein the first slot comprises a dielectric.

To further clarify, Bui discloses a bump 53 because Bui discloses a relatively abrupt protuberance 53 on a surface 30/50.

Claims 1-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over appellant's admitted prior art and Bui (5689139).

Appellant does not dispute that in the specification, at paragraphs 1-16, appellant admits as prior art the following:

A bump and vias structure, comprising; a metal layer M8; a plurality of vias 50 connecting the metal layer to another metal layer M7; a bump 44 mounted on the metal layer; wherein the bump is mounted on the metal layer via a landing pad 52.

An integrated circuit, comprising; a metal layer; a plurality of vias connecting the metal layer to another metal layer; a bump mounted on the metal layer; wherein the bump is mounted on the metal layer via a landing pad.

However, appellant does not appear to explicitly admit as prior art a first slot formed in the metal layer between the vias and the bump; second and third slots disposed between the first slot and the bump; wherein the second and third slots are displaced laterally along the metal layer and form an aperture therebetween that is centered with respect to the first slot; wherein the first slot comprises a section of the metal layer that is evacuated of conductive material; wherein the first slot comprises a current-resistant material; wherein the first slot comprises a dielectric material.

Nonetheless, as applied *supra*, Bui discloses a first slot formed in the metal layer between the vias and the bump; second and third slots disposed between the first slot and the bump; wherein the second and third slots are displaced laterally along the metal layer and form an aperture therebetween that is centered with respect to the first slot; wherein the first slot comprises a section of the metal layer that is evacuated of conductive material; wherein the first slot comprises a current-resistant material; wherein the first slot comprises a dielectric material. Moreover, it would have been obvious to combine the disclosed slots of Bui with the disclosure of appellant's admitted prior art because, as disclosed by Bui as cited, it would enhance the electromigration lifetime of the metal layer of appellant's admitted prior art.

#### **(10) Response to Argument**

Appellant argues, "Bui's disclosure is completely silent as to a bump and instead clearly discloses filling a via."

This argument is respectfully deemed unpersuasive because the alleged disclosure of Bui of filling a via would not be mutually exclusive of the disclosure of Bui of bump 53.

Relatedly, appellant contends, "bumps are conductive deposits on a top metal layer of an integrated circuit (see bumps (44) in Figure 4a of the

present application) that are used to transmit/receive signals external to the integrated circuit.”

The following is a quotation of MPEP 2111.01 [R-3] Plain Meaning:

I. THE WORDS OF A CLAIM MUST BE GIVEN THEIR “PLAIN MEANING” UNLESS THEY ARE DEFINED IN THE SPECIFICATION While the claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims must be interpreted as broadly as their terms reasonably allow. In *re American Academy of Science Tech Center*, 367 F.3d 1359, 1369, 70 USPQ2d 1827, 1834 (Fed. Cir. 2004) (The USPTO uses a different standard for construing claims than that used by district courts; during examination the USPTO must give claims their broadest reasonable interpretation.). This means that the words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification. In *re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) (discussed below); *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372, 69 USPQ2d 1857 (Fed. Cir. 2004) (Ordinary, simple English words whose meaning is clear and unquestionable, absent any indication that their use in a particular context changes their meaning, are construed to mean exactly what they say. Thus, “heating the resulting batter-coated dough to a temperature in the range of about 400oF to 850oF” required heating the dough, rather than the air inside an oven, to the specified temperature.). One must bear in mind that, especially in nonchemical cases, the words in a claim are generally not limited in their meaning by what is shown or disclosed in the specification. See, e.g., *Liebel-Flarsheim Co. v. Medrad Inc.*, 358 F.3d 898, 906, 69 USPQ2d 1801, 1807 (Fed. Cir. 2004) (discussing recent cases wherein the court expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment). It is only when the specification provides definitions for terms appearing in the claims that the specification can be used in interpreting claim language. In *re Vogel*, 422 F.2d 438, 441, 164 USPQ 619, 622 (CCPA 1970). See also *Superguide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 875, 69 USPQ2d 1865, 1868 (Fed. Cir. 2004) (“Though understanding the claim language may be aided by explanations contained in the written description, it is important not to import into a claim limitations that are not part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.”); *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (“Interpretation of descriptive statements in a patent’s written description is a difficult task, as an inherent tension exists as to whether a statement is a clear lexicographic definition or a description of a preferred embodiment. The problem is to interpret claims in view of the specification’ without unnecessarily importing limitations from the specification into the claims.”); *Altiris Inc. v. Symantec Corp.*, 318 F.3d 1363, 1371, 65 USPQ2d 1865, 1869-70 (Fed. Cir. 2003) (Although the specification discussed only a single embodiment, the court held that it was improper to read a specific order of steps into method claims where, as a matter of logic or grammar, the language of the method claims did not impose a specific order on the performance of the method steps, and the specification did not directly or implicitly require a particular order). See also paragraph III., below. There is one exception, and that is when an element is claimed using language falling under the scope of 35 U.S.C. 112, 6th paragraph (often broadly referred to as means or step plus function language). In that case, the specification must be consulted to determine the



Art Unit: 2822

structure, material, or acts corresponding to the function recited in the claim. In *re* Donaldson, 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994) (see MPEP § 2181- § 2186). In *re* Zletz, *supra*, the examiner and the Board had interpreted claims reading "normally solid polypropylene" and "normally solid polypropylene having a crystalline polypropylene content" as being limited to "normally solid linear high homopolymers of propylene which have a crystalline polypropylene content." The court ruled that limitations, not present in the claims, were improperly imported from the specification. See also *re* Marosi, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) ("Claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their broadest reasonable interpretation." 710 F.2d at 802, 218 USPQ at 292 (quoting *re* Okuzawa, 537 F.2d 545, 548, 190 USPQ 464, 466 (CCPA 1976)) (emphasis in original). The court looked to the specification to construe "essentially free of alkali metal" as including unavoidable levels of impurities but no more.). Compare *re* Weiss, 989 F.2d 1202, 26 USPQ2d 1885 (Fed. Cir. 1993) (unpublished decision - cannot be cited as precedent) (The claim related to an athletic shoe with cleats that "break away at a preselected level of force" and thus prevent injury to the wearer. The examiner rejected the claims over prior art teaching athletic shoes with cleats not intended to break off and rationalized that the cleats would break away given a high enough force. The court reversed the rejection stating that when interpreting a claim term which is ambiguous, such as "a preselected level of force", we must look to the specification for the meaning ascribed to that term by the inventor." The specification had defined "preselected level of force" as that level of force at which the breaking away will prevent injury to the wearer during athletic exertion. It should be noted that the limitation was part of a means plus function element.)

Accordingly, because appellant has provided no clear definition for the term "bump" in the specification, the specification cannot be used in interpreting the claim language "bump," and the claim language "bump" is not limited in meaning by what is shown or disclosed in the specification. Therefore, the claim language "bump" must be interpreted as broadly as the term "bump" reasonably allows, and the term "bump" must be given its plain meaning. To this end, in the rejection, the claim language "bump" has been given its plain meaning as a relatively abrupt protuberance on a surface. See "bump." *Merriam-Webster Online Dictionary*. 2005-2006.  
<http://www.merriam-webster.com> (17 Jan. 2006).

Appellant further asserts, "Simply stated, the via **51** shown in Figure 5 of Bui ***is not*** a bump."

This assertion is respectfully deemed unpersuasive because Bui is not relied on in the rejection for a disclosure that the via 51 shown in Figure 5 of Bui is a bump.

Also, appellant argues that appellant's admitted prior art does not disclose, "slots formed between vias and a bump mounted on a metal layer."

This argument is respectfully deemed unpersuasive because appellant's admitted prior art is not relied on in the rejection for this disclosure.

Similarly, appellant contends, "AAPA is not at all concerned with the electromigration lifetime of metal layers," and, "Bui, which is completely silent as to a bump, is necessarily not at all concerned with current crowding at particular regions of a bump," "Thus, there is clearly no expression of desirability within either Bui or AAPA to motivate one skilled in the art to turn to the teachings of the other."

These contentions are respectfully deemed unpersuasive because appellant's admitted prior art and Bui are not relied on in the rejection for these disclosures. To this end, it is respectfully submitted that it is recognized that references cannot be arbitrarily combined and that there must be some logical reason why one skilled in the art would be motivated

to make the proposed combination of references. In re Regel 188 USPQ 136 (CCPA 1975). The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. In re McLaughlin 170 USPQ 209 (CCPA 1971); In re Rosselet 146 USPQ 183 (CCPA 196). References are evaluated by what they collectively suggest to one versed in the art, rather than by their specific disclosures. In re Simon, 174 USPQ 114 (CCPA 1972); In re Richman 165 USPQ 509, 514 (CCPA 1970). See also Ex parte Jones, 62 USPQ2d 1206 (BdPatApp&Int 2001), (The applicant and the examiner have apparently assumed that there always must be "motivation" to combine teachings of the prior art to support a rejection based on §103(a). The assumption is not correct. The word "motivation" or a word similar to "motivation" does not appear in 35 U.S.C. § 103(a). While a finding of "motivation" supported by substantial evidence probably will support combining teachings of different prior art references to establish a *prima facie* obviousness case, it is not always necessary. For example, where a claimed apparatus requiring Phillips head screws differs from a prior art apparatus describing the use of flathead screws, it might be hard to find motivation to substitute flathead screws with Phillips head screws to arrive at the claimed invention. However, the prior art would make it more than clear that Phillips head screws and flathead screws are viable alternatives serving the same purpose. Hence, the prior art would

"suggest" substitution of flathead screws for Phillips head screws albeit the prior art might not "motivate" use of Phillips head screws in place of flathead screws. What must be established to sustain an obviousness rejection is a legally sufficient rationale as to why the claimed subject matter, as a whole, would have been obvious notwithstanding a difference between claimed subject matter and a reference which is prior art under 35 U.S.C. § 102. Once a difference is found to exist, then the examiner must articulate a legally sufficient rationale in support of a §103(a) rejection. The legally sufficient rationale may be supported by a reason, suggestion, teaching or motivation in the prior art which would have rendered obvious the claimed subject within the meaning of § 103(a). *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637(Fed. Cir. 1998) (there must be some *teaching, suggestion or motivation* in the prior art to make the specific combination that was made by the applicant); *In re Gartside*, 203 F.3d 1305, 1319, 53 USPQ2d 1769, 1778(Fed. Cir. 2000) (the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a *teaching or motivation* to combine prior art references); *Pro-Mold and Tool Co. v. Great Lakes Plastics Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1629(Fed. Cir. 1996) ("there must be a *reason, suggestion, or motivation* \*\*\* to combine [the teachings of] \*\*\* references \*\*\*"); *Smiths Industries Medical Systems, Inc. v. Vital Signs*,

*Inc.*, 183 F.3d 1347, 1356, 51 USPQ2d 1415, 1420-21 (Fed. Cir. 1999)

(there is no basis for concluding that an invention would have been obvious solely because it is a combination of elements that were known in the art at the time of the invention; the relevant inquiry is whether there is a *reason*, *suggestion*, or *motivation* in the prior art that would lead one of ordinary skill in the art to combine the teachings of the references)). In the instant rejection, legally sufficient rationale as to why the claimed subject matter, as a whole, would have been obvious has been provided.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

David E. Graybill



Conferees:

Drew A. Dunn

Zandra V. Smith

